

Fig.

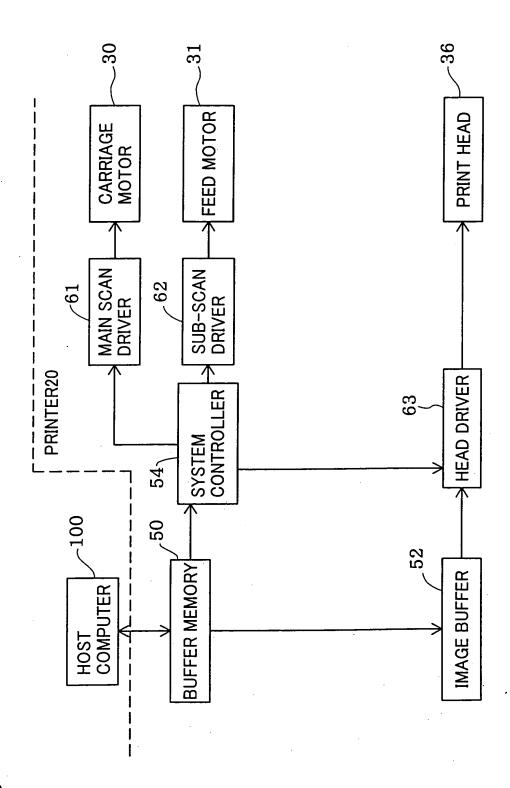
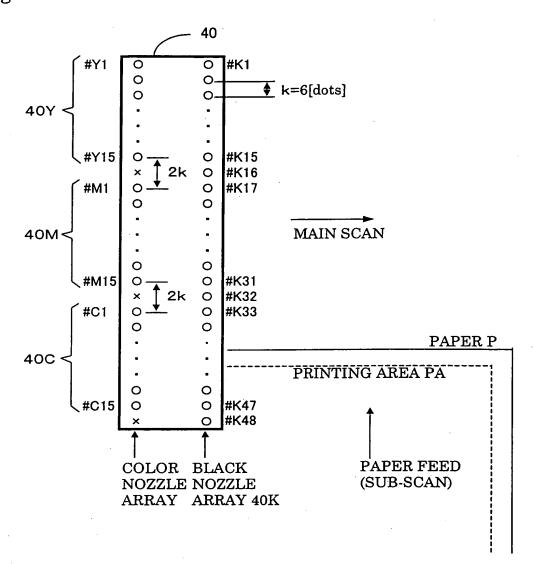


Fig.

Fig. 3



F i g. 4 (A) CONCEPT OF SUB-SCAN FEED(s=1)

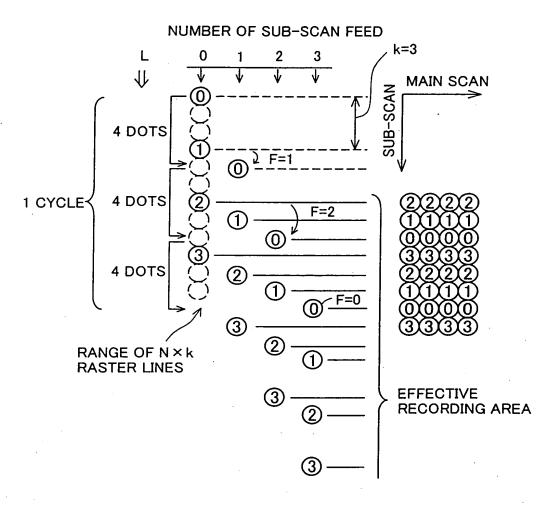


Fig. 4 (B) PARAMETERS

NOZZLE PITCH k : 3 [dot] NUMBER OF USED NOZZLES N : 4 NUMBER OF SCAN REPEATS s : 1

NUMBER OF EFFECTIVE NOZZLES Neff: 4

NUMBER OF SUB-SCAN FEED	0	1	2	3
FEED AMOUNT L [dot]	0	4	4	4
ΣL	0	4	8	12
F=(ΣL)%k	0	1	2	0

Fig. 5 (A) CONCEPT OF SUB-SCAN FEED(s=2)

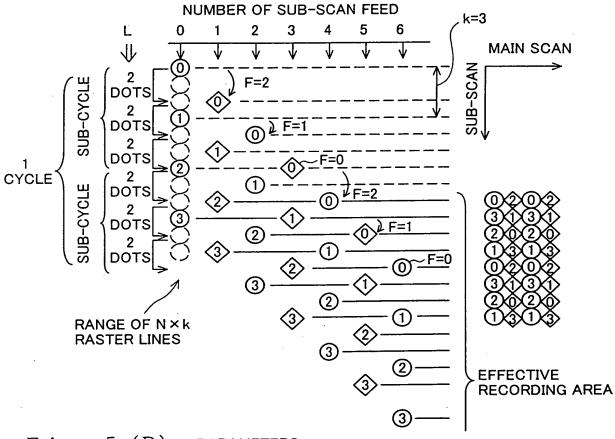


Fig. 5 (B) PARAMETERS

NOZZLE PITCH k : 3 [dot] NUMBER OF USED NOZZLES N : 4 NUMBER OF SCAN REPEATS s : 2

NUMBER OF EFFECTIVE NOZZLES Neff: 2

NUMBER OF SUB-SCAN FEED	0	1 .	2	3	4	5	6
FEED AMOUNT L [dot]	0	2	2	. 2	2	2	2
ΣL	0	2	4	6	8	10	12
F=(ΣL)%k	0	2	1	0	2	1	0

SCAN PARAMETERS IN FIRST EMBODIMENT

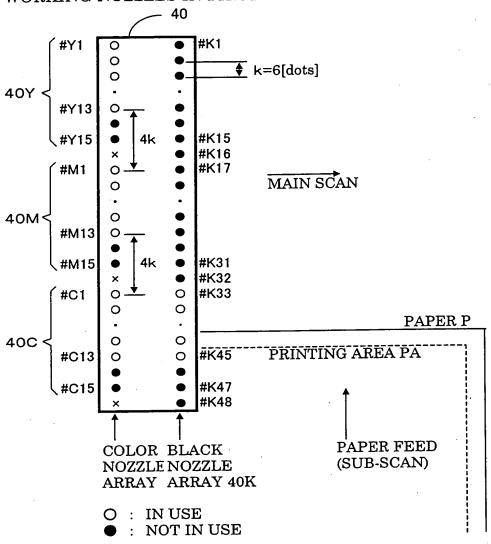
Nozzle pitch : k = 6 [dots]

Number of scan repeats: s = 1
Number of working nozzles: N = 13
Number of effective nozzles: Neff = 13

	- 41	0		. 4		- 6	7
PASS No.	1	2	3	4	ว	0	
SUB-SCAN No	0	1	2	3	4	5	6
FEED L [dots]	0	13	13	13	13	13	13
ΣL	0	13	26	39	52	65	78
$F=(\Sigma L)%k$	0	1	2	3	4	5	0

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Fig. 7 WORKING NOZZLES IN FIRST EMBODIMENT



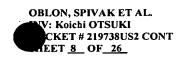


Fig. 8

FIRST EMBODIMENT

RASTE	R									, ,)	.1.1.	1										
LINE						\mathbf{P}^{A}	SZ	No														٠	
No.	1	1 :	2 :	3	4	5 6	3	7 - 1	8	9 1	0_1	1 1	2 1:	3 1	4 1	5 1	6 1	7 1	8 1	9			
1	C1	1			-				$oxed{1}$		Τ.	T	М		7	T	T	Т		' 4	7		
2		C	9				\perp	M1	2					%	第	\top		\top	1	Y:	2		
3	\perp	\perp	C	$\overline{}$					M1	0					Yi	3	\top	\top		\top	7		
4	<u> </u>	↓	↓_	1 c		1	┸	4_		М	8	\perp				Y1	1		T		1		
5	<u> </u>	↓	┦	┦—	C		↓_	4	┷	┷	M		┸				Y	9]		
6	<u>_</u>	<u></u>		<u> </u>	-	C1			<u> </u>	<u> </u>	<u> </u>	<u></u>	4	<u> </u>	上			Y	7		Cm	is	
7	C12	+	↓_	┶	<u> </u>			4	<u>.l</u>	<u> </u>	<u> </u>	<u>L</u>	M:	2	<u></u>		1		Y	5	Mm	is	
8	<u></u>	C10	-	1_		Ь.	_	M1:	3					×		T			T	Y3	3	=	
9	<u></u>	<u> </u>	CE	-	1_	<u> </u>	_	Ц.	M1	Ц											YI	Ym	is
10	<u></u>	↓		C	+-	ļ	_	ļ	<u> </u>	M:	9					Y1	2		T	T^{-}	L	T	=
11	<u> </u>	┞	╄	↓_	C4	-		↓	╀	<u> </u>	M7	+-					Y10)		1]	
12	<u></u>	╄	 _	╄	<u> </u>	C2		<u>Ļ</u>	 	辶	<u> </u>	J M:	<u>il</u>		<u> </u>	<u> </u>	<u> L</u>	Y	В		<u> </u>	Cm	is
13	C13	+	↓	_	↓_	<u> </u>	×	<u> </u>	<u> </u>	Ц.	丄	$oldsymbol{ol}}}}}}}}}}}}}}}}}$	M3		上				Y	6			_
14	<u> </u>	C11	+	Ľ.	┞	ļ			_	<u> </u>	<u> </u>	<u></u>	<u> </u>	M			<u>. </u>			Y4		Mm	is
15		<u> </u>	C9	+-		<u> </u>			M12	:										\mathbf{I}	Y2	Ymi	s
16		<u> </u>	<u> </u>	C7		<u> </u>	<u> </u>			M10	<u> </u>	<u> </u>	<u> </u>			Y1:	3			Τ			=
17	<u> </u>	<u> </u>	<u> </u>	└	C5		<u> </u>	<u> </u>	ــــ	<u> </u>	M8		<u> </u>			\perp	Y11]	
18	,,,,,,,		 -	├	<u> </u>	C3	_	L_	ـــــ	<u> </u>	1	Me		_	ـــــ			YS	2]	
19			┢	├	├	ļ	C1		_	 -	<u> </u>	_	M4		<u> </u>	↓		 	Y	+-			
20	├—	C12	-	┢	 	<u> </u>	_		_	<u> </u>	—	<u> </u>	ļ	M2	+-	┥_	<u> </u>	↓	Ļ	Y5			
21 22	<u> </u>	├	C10	C8	├	 		<u> </u>	M13	—	<u> </u>	<u> </u>	├—	<u> </u>	×			 	↓_	↓	Y3		_
23	\vdash	 	├	C8	C6	-		├	⊢	M11	М9	<u> </u>	 —	├	╄		_	-		↓	<u> </u>	Y1	1
24	<u> </u>		 	┢	- 00	C4		\vdash	 	⊢	M9	M7	-	┝╌	╀─	╂	Y12		_	├ ─			ļ
			-	┢	┢	-57	C2		-	├	 	W17	M5	├	₩	+	1	Y10		-			ł
26		C13				 		×	-	 -	<u> </u>		1413	мз	┢	╁	┢	├	Y8	Y6			1
27			C11							 		-		1413	М	\vdash	├	⊢	├	10	Y4	_	┨
28			-	C9						M12					141	3		├─	├	\vdash	14	Y2	ł
29					C7						M10				\vdash		Y13	\vdash	├~	\vdash			ł
30	Ì				•	C5						M8				1	1	Y11	_	+			l
31	ĺ						C3				М		М6		1	T^{-}			Y9	1-1	\neg		1
32								C1						M4		1				Y7			1
33			C12												M2				_	\square	Y5		ı
34				C10						M13						×						Y3	l
35	[C8						M11									\Box	_		Г
36	L]	C6						М9						Y12					Γ
37							C4						М7						Y10				Ľ
38								C2				\Box		М5						Y8			Ē
39		Į.	C13						×				l]	М3						Y6		
40		Ĺ		C11							1		I			M1						Y4	

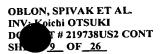
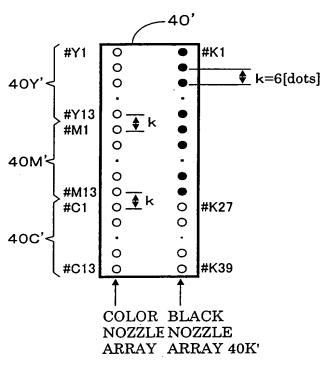


Fig. 9
WORKING NOZZLES IN FIRST COMPARATIVE EXAMPLE



O: IN USE

• : NOT IN USE

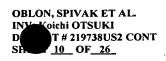


Fig. 10

FIRST COMPARATIVE EXAMPLE

RASTE	\mathbf{R}																				
LINE						PA	SS :	No.											,		
No.	1	2	3	4	_ 5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		
1	C11						M11		<u> </u>				Y11								
2		C9						М9	${\mathsf L}_{-}$	Ĺ				Y9							
3			C7						M7					<u> </u>	Y7						
4				C5						M5				<u>L_</u>	<u> </u>	Y5					
5					C3						М3			<u> </u>	<u> </u>		Y3				
6			<u> </u>		نــِـــا	<u>C1</u>	<u> </u>	Ĺ	<u> </u>	<u> </u>		M1	<u></u>		Ŀ,	<u> </u>		Y1	Cmis,	Mmis, Y	mis
7	C12						M12						Y12		L_						
8		C10						M10	<u> </u>					Y10		Ш					
9			C8				L	L	M8	Ŀ					Y8	_					
10				C6					<u> </u>	М6				Щ.	<u> </u>	Y6					
11	<u></u>				C4		L_		<u> </u>		M4			L	ļ.—	L	Y4				
12						C2			<u> </u>			М2	L	<u> </u>	<u> </u>			Y2	Cmis,	Mmis, Y	<u>'mis</u>
13	C13						M13		<u> </u>	<u> </u>			Y13	_		ļ					
14		C11						M11	L.					Y11		L					
15			C9						М9					<u> </u>	Y9						
16				C7					<u> </u>	M7				<u> </u>	<u> </u>	Y7					
17					C5		<u> </u>			ļ	M5			ļ	! —		Y5				
18						C3				\vdash		М3		<u> </u>	<u> </u>	\vdash		_Y3			
19							C1		<u> </u>				M1	\/10	<u> </u>				Y1		
20		C12	242					M12		-			-	Y12	V10				\vdash		
21			C10						М10	140				_	Y10	Y8					
22				C8	- 06		-		_	M8	М6			 	-	10	Y6		\vdash		
23					C6	C4			├		MID	М4			-	-	-10	Y4	H		
24				-		- 04	C2			-		171-4	M2	\vdash					Y2		
25 26		C13					02	M13		 			1412	Y13	<u> </u>						
20 27	ı	013	C11						M11			-			Y11	\vdash			\Box		
28				C9	$\neg \neg$					М9		-				Y9					
29			\neg	-	C7				 		M7	_					Y7				
30						C5			 			М5						Y5			
31			_				C3						МЗ						Y3		
32								C1						M1						Y1	
33		- 1	C12						M12						Y12					\neg	
34				C10						М10						Y10					
35			$\neg \neg$		C8						M8						Y8				
36						C6						M6						Y6			
37							C4						M4						Y4		
38								C2						M2						Y2	
39		[C13						М13						Y13	\Box					
40			I	C11					L	M11						Y11			Ш		

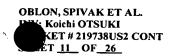


Fig. 11

EQUIVALENT NOZZLE POSITIONING

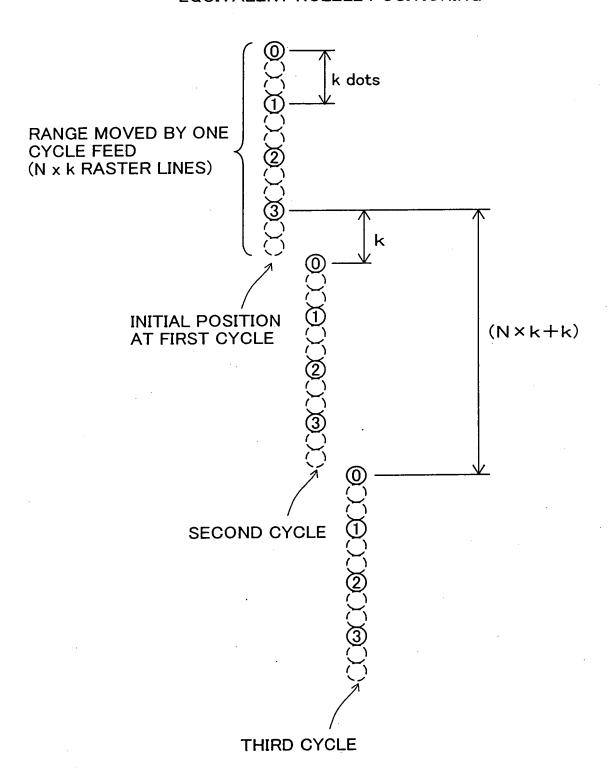


Fig. 12

SCAN PARAMETERS IN SECOND EMBODIMENT

Nozzle pitch : k = 6 [dots]

Number of scan repeats: s = 1

Number of working nozzles: N = 15 Number of effective nozzles: Neff = 15

PASS No.	1	2	3	4	5	6	7
SUB-SCAN No	0	1	2	3	4	5	6
FEED L [dots]	0	14	15	16	16	15	14
ΣΙ	0	14	29	45	61	76	90
$F=(\Sigma L)%k$	0	2	5	3	1	4	0

Fig. 13
WORKING NOZZLES IN SECOND EMBODIMENT

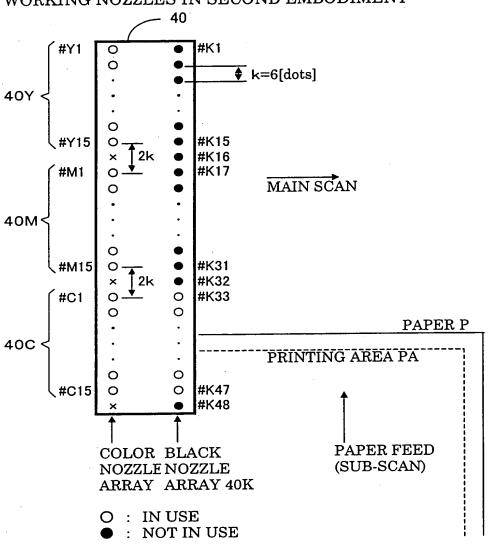




Fig. 14

SECOND EMBODIMENT

	_																					
RASTE	R					D 4 4	~~ ·	LΤ.														
LINE			_			PA			_	10		10	10	1.4	15	16	17	10	10			
No.	1	2	_3	4	_ 5	6	7	8		10	-'' -	14	13		Y10	- 10	' '1	 ~	13			
1			C8						М9				V1 E		- 10		\dashv	⊣	Cmic	, Mmis,	Vmic	
2	C13						M14						Y15				VE		Cinis	, MITTIS,	TIMES	
3					C3			L			M4		_			-	Y5					
4		C11						M12						Y13		Y8						
5				C6	_					M7						18		Y3				
6						C1						M2			1/11			-13	•	V:-		
7			C9					<u> </u>	М10		 ∤				Y11					Ymis_		*
8	C14						М15	<u> </u>					×						YI	Cmis,	Mmis	
9		I			C4						М5						Y6					
10		C12						M13						Y14								
11				C7			L.			М8						Y9	—4					
12						C2						М3		<u> </u>				Y4				
13			C10						M11					<u> </u>	Y12					Mmis,	Ymis	
14	C15						×						M1				_		Y2			
15		\Box			C5						М6						Y7					
16		C13						M14						Y15		\Box						
17			$\neg \neg$	C8						М9				L		Y10						
18						C3						M4		<u> </u>				Y5				
19		ΗП	C11						M12					<u>L_</u>	Y13	ليبا				Cmis,	<u>Mmis,</u>	Ymis
20							C1		Γ				M2						Y3			
21					C6						М7					<u></u>	Y8		<u> </u>	L		
22		C14					<u> </u>	М15						×						Y1		
23		 		C9		\vdash		 		М10			<u> </u>			Y11						
24						C4						М5						Y6				
25			C12						M13						Y14				L			
26							C2						МЗ					<u>. </u>	Y4			
27					C7		F	Г			M8						Y9					
28		C15						×						M1						Y2		
29				C10						M11						Y12		<u> </u>	<u>L</u>			
30						C5	T					М6			<u> </u>			Y7				
31			C13						M14						Y15		<u> </u>		<u> </u>			
32							C3		Ī				M4	Γ_{-}			<u> </u>	<u> </u>	Y5	<u> </u>		
33			_		C8		\vdash			\Box	М9					<u> </u>	Y10	<u> </u>		<u> </u>		
34					\Box			CI						M2					<u>L</u>	Y3		
35				C11				1		M12			Γ.			Y13					İ	
36						C6						М7	П					Y8	<u>L</u> _	<u> </u>	L_	
37			C14	<u> </u>			T	T	M15	\Box	Π		Ī		×						Y1	
38			۳	\vdash			C4	1	\Box		П		М5				L		Y6			
38 39			<u> </u>		C9	\vdash			T^{-}	Π	M10		Ī				Y11				Ш	
39 40			\vdash	\vdash		†	T^-	C2		T	\sqcap		Π	МЗ						Y4		
.40					Ь—				_									-				

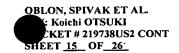
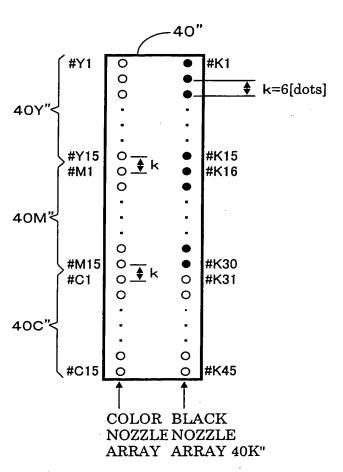


Fig. 15
WORKING NOZZLES IN SECOND COMPARATIVE EXAMPLE



O: IN USE

• : NOT IN USE

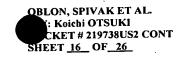


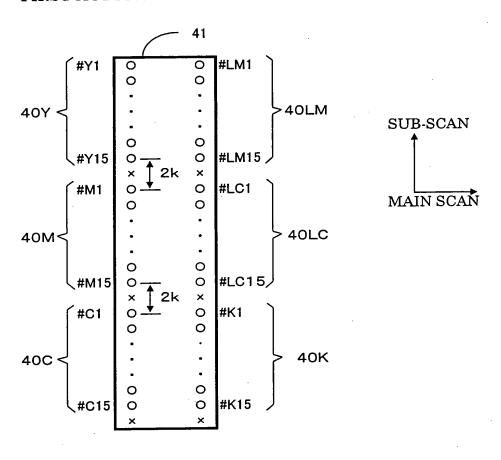
Fig. 16

SECOND COMPARATIVE EXAMPLE

3 C3 M3 Y3 4 C11 M11 Y11 5 C6 M6 Y6 6 C1 M1 Y1 7 C9 M9 Y9	9 <u>Amis, Y</u> mis nis, Mmis, Ymis
1	<u>Mmis, Y</u> mis
2 C13 M13 Y13 Cmis. A 3 C3 M11 M3 Y11 Y11 5 C6 M6 Y6 6 C1 M6 M1 Y11 7 C9 M9 Y14 Cr 9 C4 M12 Y12 Y12	
3 C3 M3 Y3 4 C11 M11 M11 Y11 5 C6 M6 M1 Y6 6 C1 M9 Y9 7 C9 M14 Y14 Cr 9 C4 M12 Y12 Cr	
4	nis Mmis Ymie
5	nis Mmis Ymis
6 C1 M1 Y1 7 C9 M9 Y9 Cr 8 C14 M14 Y14 Cr 9 C4 M12 Y12 Y12	nis Mmis Ymie
7 C9 M9 Y9 Cr 8 C14 M14 Y14 Cr 9 C4 M4 Y12 Y12	nis Mmis Ymie
8 C14 M14 Y14 Cr 9 C4 M4 Y12 Y12	nis Mmis Ymie
9 C4 M4 Y4 10 C12 M12 Y12	nis Mmis Ymis
10 C12 M12 Y12	
11	
12 C2 M2 Y2	
13 C10 M10 Y10	
	nis, Mmis, Ymis
15 C5 M5 Y5	
16 C13 M13 Y13	
17 C8 M8 Y8	
18 C3 M3 Y3	
19 C11 M11 Y11	
	<u>'1</u>
,	
22 C14 M14 Y14 Y14 Y23 C9 M9 Y9	┥
23 C4 M4 Y4	
25 C12 M12 Y12	-
	2
27 C7 M7 Y7	7
28 C15 M15 Y15	1
29 C10 M10 Y10	7
30 C5 M5 Y5	1 .
31 C13 M13 Y13	7
32 C3 M3 Y	3
33 C8 M8 Y8	
34 C1 M1	Y1
35 C11 M11 Y11	
36 C6 M6 Y6	
37 C14 M14 Y14	
38 C4 M4 Y	4
39 C9 M9 Y9	4-4
40 C2 M2 M2	Y2

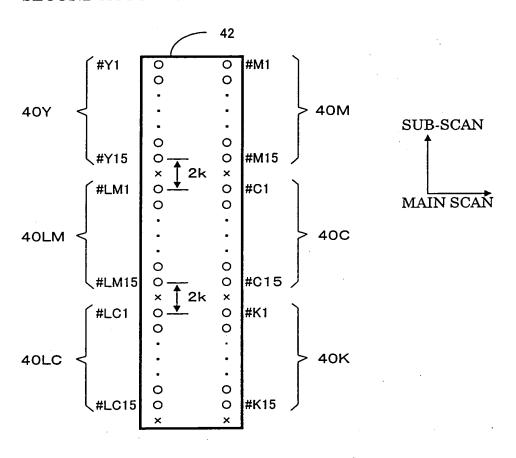
The state of the s

Fig. 17
FIRST ACTUATOR VARIATION



The state of the s

Fig. 18
SECOND ACTUATOR VARIATION



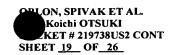


Fig. 19
THIRD ACTUATOR VARIATION

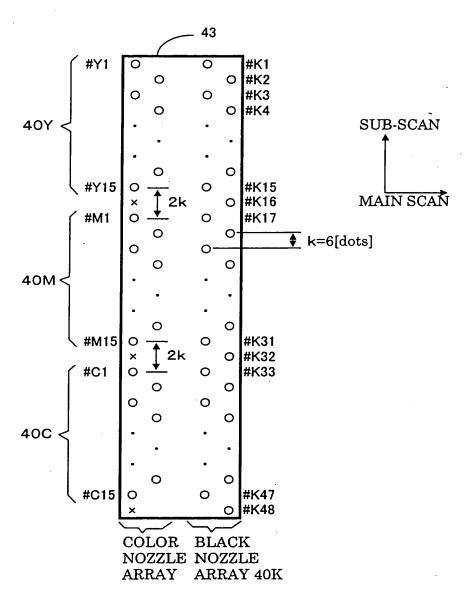
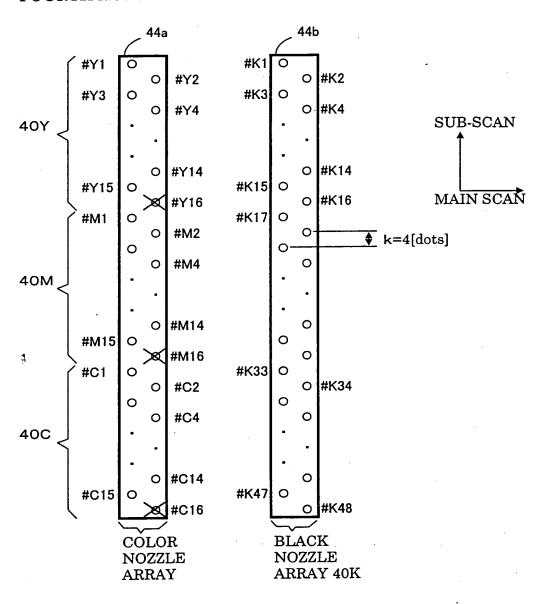


Fig. 20
FOURTH ACTUATOR VARIATION



1

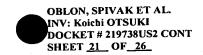
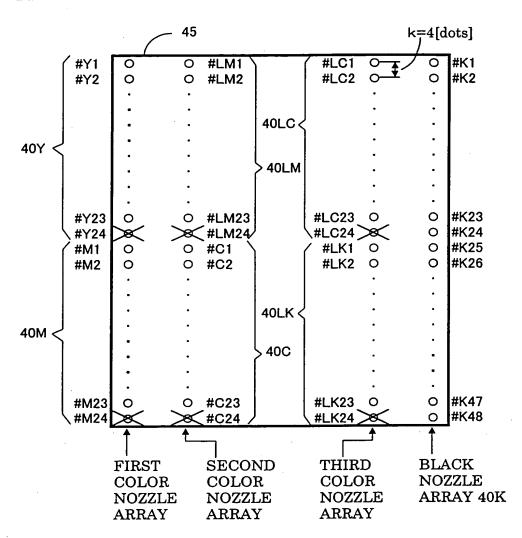


Fig. 21
FIFTH ACTUATOR VARIATION



MAIN SCAN

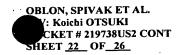
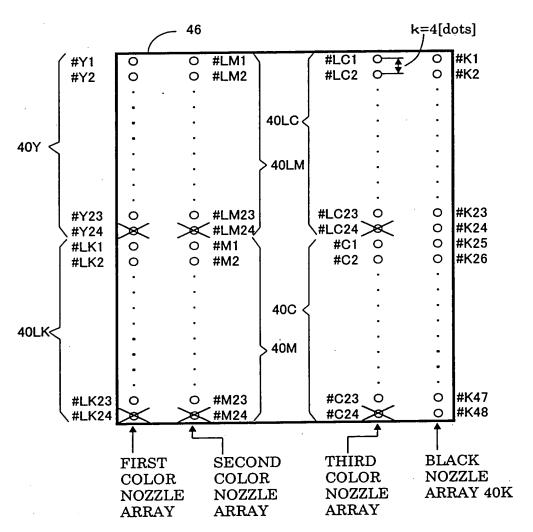


Fig. 22
SIXTH ACTUATOR VARIATION



MAIN SCAN

The state of the s

Fig. 23
SEVENTH ACTUATOR VARIATION

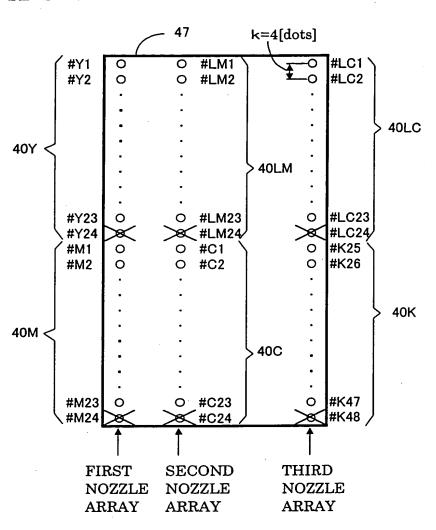
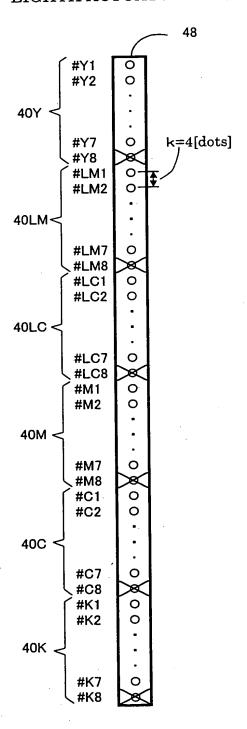


Fig. 24
EIGHTH ACTUATOR VARIATION



INTERLACE SCHEME

NUMBER OF NOZZLES: N = 3
NOZZLE PITCH: K = 2 [DOTS]
NUMBER OF SCAN REPEATS: s = NOZZLE DENSITY: D [DOTS/INCH]
SUB-SCANNING PITCH: L [INCH]

THIRD SCAN , L= _____ SECOND SCAN RECORDING ORDER <u>R</u>=3 MAIN SCANNING DIRECTION FIRST SCAN LEGEND: (31 NOZZLE No.

Fig. 2

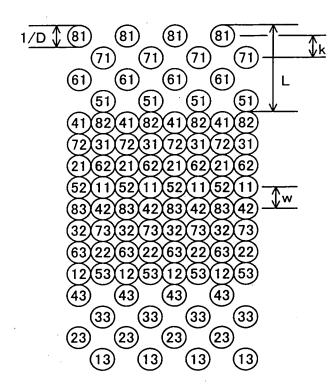
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Fig. 26

OVERLAP SCHEME



NUMBER OF NOZZLES: N = 8 NOZZLE PITCH: k = 1 [DOTS] NUMBER OF SCAN REPEATS: s = 2 NOZZLE DENSITY: D [DOTS/INCH] SUB-SCANNING PITCH: L [INCH]

DOT PITCH: w [INCH]